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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/648,958	08/25/2000	Peter Michael Edic	RD-27,641	6139

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH CENTER
PATENT DOCKET RM. 4A59
PO BOX 8, BLDG. K-1 ROSS
NISKAYUNA, NY 12309

EXAMINER

KIM, CHONG R

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 05/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/648,958

Applicant(s)

EDIC ET AL.

Examiner

Charles Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-103 is/are pending in the application.
- 4a) Of the above claim(s) 9-18, 27-40 and 46-103 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 19-26 and 41-45 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

Species A, claims 2-8, 20-26, 42-45

Species B, claims 9-18, 27-40

Species C, claims 46-78

Species D, claims 79-103

2. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1, 19, and 41 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after

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the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

During a telephone conversation with Donald Ingraham (Registration No. 33,714) on May 23, 2003, a provisional election was made with traverse to prosecute the invention of Species A, claims 2-8, 20-26, 42-45. Affirmation of this election must be made by applicant in replying to this Office action. Claims 9-18, 27-40, 46-103 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 19-22, 41-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Wilting, U.S. Patent No. 5,757,877 (“Wilting”).

Referring to claim 1, Wilting discloses an image data analysis method, comprising:

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a. fitting a profile from a selected family of profiles to a selection portion of image data representing an imaged object (col. 6, lines 23-47 and figure 3)

b. computing a magnitude of an extensional feature of the imaged object based on the fit profile [col. 6, lines 54-57. Wilting explains that the width of the profile is computed to determine the dimension of the detail, wherein the dimension of the detail includes the diameter of the blood vessel, see col. 5, lines 60-64. Note that determining the diameter of the blood vessel is interpreted as being analogous to computing a magnitude of an extensional feature].

Referring to claim 2, Wilting further discloses that the image data represents a cross section of the imaged object at a corresponding axial position on a specified axis (col. 6, lines 4-7), and the extensional feature is a spatial extent (diameter) of a structure (blood vessel) of the imaged object at the axial position on the specified axis (col. 5, lines 60-64).

Referring to claim 3, Wilting further discloses that the imaged object comprises an organ of a living subject and the structure is a blood vessel of the organ (col. 5, lines 53-64 and figure 2).

Referring to claim 4, Wilting further discloses that the living subject is a human patient (col. 5, lines 11-14 and figure 1) and the blood vessel is an artery (col. 7, lines 60-63).

Referring to claims 19 and 41, see the rejection of at least claim 1 above.

Referring to claims 20 and 42, see the rejection of at least claim 2 above.

Referring to claims 21 and 43, see the rejection of at least claim 3 above.

Referring to claim 22, see the rejection of at least claim 4 above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-6, 23-24, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilting, U.S. Patent No. 5,757,877 ("Wilting").

Referring to claim 5, Wilting discloses that the image data represents a cross section of the imaged object at a corresponding axial position on a specified axis (col. 6, lines 4-7), wherein the selected portion of the image data represents a structure comprising a wall portion defining an interior region within the structure (figure 2).

Wilting also teaches that the extensional feature is a diameter of the interior region defined by the cross section of the structure (col. 5, lines 60-64). However, Wilting fails to teach that the extensional feature is an area of a cross section of the interior region at the axial position on the specified axis. The Examiner notes that the structure (blood vessel) that defines the extensional feature is assumed to have a tubular shape, wherein the cross section of the interior region of a tubular structure is circular. It is also noted that the diameter (d) of a circle is related to the area (A) by the relationship $A = \pi * (d/2)^2$. Therefore, computing the magnitude of the diameter of a circle inherently determines its area, and vice versa. The Examiner notes that it would have been obvious to modify the extensional feature of Wilting so that the extensional feature represents an area of a cross section of the interior region at the axial position on the

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specified axis; since the diameter and the area of a circle can be used interchangeably, in other words the area of the circle can be represented by its diameter.

Referring to claim 6, Wilting discloses that the image data represents a cross section of the imaged object at a corresponding axial position on a specified axis (col. 6, lines 4-7), wherein the selected portion of the image data represents a cross section of a structure of an imaged object (figure 2).

Wilting also teaches that the extensional feature is a diameter of a region defined by the cross section of the structure (col. 5, lines 60-64). However, Wilting fails to teach that the extensional feature is an area of the region defined by the cross section of the structure. The Examiner notes that the structure (blood vessel) that defines the extensional feature is assumed to have a tubular shape, wherein the cross section of a tubular structure is circular. It is also noted that the diameter (d) of a circle is related to the area (A) by the relationship $A = \pi * (d/2)^2$. Therefore, computing the magnitude of the diameter of a circle inherently determines its area, and vice versa. The Examiner notes that it would have been obvious to modify the extensional feature of Wilting so that the extensional feature represents an area of the region defined by the cross section of the structure; since the diameter and the area of a circle can be used interchangeably, in other words the area of the circle can be represented by its diameter.

Referring to claims 23 and 44, see the rejection of at least claim 5 above.

Referring to claim 24, see the rejection of at least claim 6 above.

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5. Claims 7-8, 25-26, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilting, U.S. Patent No. 5,757,877 ("Wilting"), further in view of Troussel et al., U.S. Patent No. 5,218,534 ("Troussel").

Referring to claim 7, Wilting discloses that the image data represents a cross section of the imaged object at a corresponding axial position on a specified axis (col. 6, lines 4-7), and the selected family of profiles is a family of functions of an independent variable (col. 6, lines 23-47 and figure 3). However, Wilting fails to teach that the family of profiles is a family of functions of two independent variables.

The Examiner notes that a family of functions of two independent variables was exceedingly well known in the art. For example, Troussel teaches image data that represents a cross section of an imaged object at a corresponding axial position on a specified axis (col. 8, lines 9-15. Note that the plane $z_i = \text{constant}$ is interpreted as a cross section of the object, see figure 3), wherein a family of profiles is a family of functions of two independent variables [col. 8, lines 9-67. Note that equation 17 is interpreted as a family of functions of two independent variables x and y (z is constant, as noted above)].

Wilting and Troussel are both concerned with analyzing cross sectional medical image data. Troussel's method provides an image of a 3D object under study which are more sharply defined and obtained more rapidly (Troussel, col. 1, lines 22-25). Therefore, it would have been obvious to modify the family of profiles of Wilting, so that it is a family of functions of two independent variables, as taught by Troussel; in order to improve the accuracy of the diagnosis by providing an accurate profile of the imaged object.

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Referring to claim 8, Trouset further discloses that the family of profiles is a family of two-dimensional Gaussian profiles (col. 8, lines 9-22 and col. 9, lines 15-20).

Referring to claims 25 and 45, see the rejection of at least claim 7 above.

Referring to claim 26, see the rejection of at least claim 8 above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Greenberg et al. U.S. Patent No. 6,301,498 discloses a method of determining stenosis by fitting profiles to the image.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The examiner can normally be reached on Monday thru Thursday 8:30am to 6:00pm and alternating Fridays 9:30am to 6:00pm.

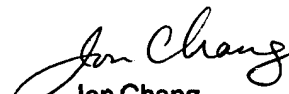
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.


ck

May 28, 2003


Jon Chang
Primary Examiner